

AUSTRALIAN LEAF-HOPPERS (*Jassoidea*, *Homoptera*).

PART 6.*

PENTHIMIIDAE.

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(Text-figure 1.)

The Penthimiidae are a family of leaf-hoppers of world-wide distribution, representatives of the genus *Penthimia* Germar occurring in every one of the major zoogeographical regions. In 1923 Baker erected the family Thaumatoscopidae, which presumably in addition to *Thaumatoscopus* Kirk. was intended to include the closely related genus *Vulturnus* Kirk. Although the heads of species in the genus *Thaumatoscopus* which are apically foliaceous, differ markedly from those of species in the genus *Penthimia*, which are obtusely rounded between the declivous crown and the ventral surface of the head, there is little doubt that the two genera are closely related. Intermediate forms occur in *Vulturnus* Kirk. and *Neovulturnus* gen. nov. Apart from occipital characters, the venation of the tegmina and the structure of the hind tibiae and male genitalia, are so similar in all four genera, that there seems no good reason why even a sub-family of the Penthimiidae should be erected to hold the genera previously included in the Thaumatoscopidae.

Such few representatives of this family as occur in Australia appear to be confined to Queensland and New South Wales, being especially abundant in the former. This distribution suggests that their establishment in this continent is of comparatively recent date.

PENTHIMIA Germar.

Mag. Ent. 4 ; 46, 1821.

The head ventrally is flat longitudinally, slightly convex transversely and the labium is short. The lateral frontal sutures are distinct above, as well as below, the antennal ledges ; the antennal ledges are prominent and the antennal pits shallow. Dorsally the head is declivous, the apical margin is evenly rounded and the anterior third medianly, is occupied by the hind portion of the frons. The ocelli which are situated close to the hind margin of the frons are closer to the eyes on each side than to each other.

* Previous parts in this series appeared in the Trans. Roy. Soc. S. Aust. vs. 57, 58 (1933-1934), and in the Papers of the Roy. Soc. Tas. for 1935-1936.

The pronotum narrows anteriorly and is wide laterally, and the propleurae widely separate the eyes from the bases of the tegmina. The tegmina are flattened, not teetiform, have distinct venation and wide appendices that terminate at the apices of the tegmina. There is no development of a supplementary appendix. The hind tibiae are flattened and bear four rows of closely set spines. The male genitalia have wide sub-genital plates and short parameres.

PENTHIMIA AUSTRALIS Walker.

(Fig. 5.)

Scaris australis Walk. List Homopt. Supplement 253. 1858.

Length, 7 mm.; general coloration, brownish-red. *Head* ventrally black but for the external borders of the maxillary plates, the region immediately surrounding the antennae and the frons posteriorly, which are brownish-red. Dorsally pale reddish-brown, the frons somewhat paler in colour than the rest of the crown. *Pronotum* and *Scutellum*, brownish-red. *Tegmen*, hyaline brownish-red. *Thorax*, ventral surface and legs, marked with a pattern of black and red. *Abdomen*, ventral surface, brownish-red, the last ventral segment in the female greater in length than the whole of the proximal abdominal segments.

Distribution, Queensland.

PENTHIMIA VANDUZEII Kirk.

Ectopiocephalus vanduzeei Kirk. H.S.P. Exp. Sta. Bull. 1 (9); 464, 1906.

Penthimia reticulata Dist. Ann. Soc. Ent. Belg. 52; 108, 1908.

Distant's description of this species is adequate, hence re-description is unnecessary. *Penthimia vanduzeei* is smaller than *Penthimia australis*, and is largely black in colour. Figures 1-4 represent the tegmen, head, thorax, and male genitalia.

Distribution, Queensland, New South Wales, Central Australia.

NEOVULTURNUS gen. nov.

Kirkaldy (1907), separated *Vulturinus* Kirk. into two divisions, but did not give them generic rank. The genus defined below represents Kirkaldy's Division 2, characterised as having the "margin of the head blunt, subfoliaceous."

The head is evenly rounded apically, the vertex and posterior third of the frons, which constitutes the crown not being produced, and the labium is short. The hind margin of the frons may be distinct or indistinct. The pronotum is wide laterally and the propleurae separate the eyes from the bases of the tegmina. The tegmina have in addition to a wide appendix, a supplementary appendix, consisting of the two cells

that lie against the hind apical margin of the tegmen. This supplementary appendix is not pigmented and causes an irregularity in the apical margins of the tegmina. The legs are flattened and the apices of the hind femora rest just behind the eyes. When at rest the hind femora pass between the middle femora and the thorax. The hind tibiae are armed with four rows of closely set spines and the male genitalia have broad sub-genital plates and short parameres. The following species placed by Kirkaldy in Division 2 of his genus *Vulturnus* are transferred to *Neovulturnus*: *vanduzeei* (Type), *vaecors*, *vultuosus*, *vaedulcis* and *vappa*. Four new species are described below.

NEOVULTURNUS BRUNNEUS sp. nov.

(Figs. 8, 9.)

Length, 3.5 mm. ; general coloration, brown mottled with white.

Head, ventrally black, dorsally dark brown with numerous small cream-coloured maculations ; eyes dark brown ; hind margin of frons perceptible. *Pronotum* concolorous with the head. *Scutellum* pale ochreous with dark brown markings. *Tegmen* short, the apical overlap steeply declivous, reticulate ; veins and reticulations brown, the rest of the appendix opaque white. Appendix and supplementary appendix pale hyaline brown. A dark brown transverse fascia extends from the distal end of the claval suture to the costal margin of the tegmen. *Thorax* and *abdomen*, ventral surface black. Fore-legs, femora black, tibiae and tarsi cream-coloured. Middle-legs femora black ; tibiae and tarsi cream with black markings. Hind legs entirely black but for the spines on the hind tibiae which are whitish.

Type ♀, from Stanthorpe, Queensland, in the collection of the Queensland Museum. Reg. No. 5200.

NEOVULTURNUS PALLIDUS sp. nov.

(Fig. 10.)

Length, 4 mm. ; general coloration black or brown, the scutellum white or yellow.

Head, ventrally black or very dark brown ; external borders of maxillary plates white. Crown of head and antennal ledges medianly white. *Pronotum*, light or dark brown mottled with cream or grey. *Scutellum*, either entirely white or very pale yellow, or whitish with dark brown markings. *Tegmen*, whitish, mottled with an irregular and variable pattern of light or dark brown. *Thorax*, ventral surface black, with or without dark brown markings. *Abdomen*, ventral surface, light or dark brown.

Type ♀, from Mt. Glorious, Queensland (coll. H. Hacker), in the collection of the Queensland Museum. Reg. No. 5201.

NEOVULTURNUS MACULOSUS sp. nov.

(Figs. 6, 7.)

Length, 3.5 mm. ; general coloration black.

Head, ventrally, longitudinally concave, black ; crown black, with an anterior median more or less circular pale area, with or without a few or several brown spots. Hind margin of frons indistinct. *Pronotum*, shining black. *Scutellum*, entirely black or entirely pale yellow. *Tegmen*, opaque black with numerous whitish spots lying between the veins. Appendix and supplementary appendix hyaline. *Thorax* and *abdomen*, ventral surface and legs black.

Type ♂, from Brookfield, Queensland (coll. H. Hacker), in the collection of the Queensland Museum. Reg. No. 5202.

NEOVULTURNUS LAPSUS sp. nov.

(Figs. 11, 12, 13.)

Length, 2.8 mm. ; general coloration black.

Head, entirely black, but for the eyes which are dark brown, and the ocelli which are whitish. *Pronotum* and scutellum, black. *Tegmen*, black with numerous small white spots on the proximal half and somewhat larger white spots distally. The two spotted areas are not adjacent to each other but are separated by a black transverse area. Appendix and supplementary appendix opaque brown. *Thorax*, ventral surface and legs, black. *Abdomen*, ventral surface, greyish-black.

Type ♂, from Blunder, Queensland (coll. H. Hacker), in the collection of the Queensland Museum. Reg. No. 5203.

VULTURNUS Kirk.

H.S.P.A. Exp. Sta. Bull. 1 (9) ; 463, 1906.

This genus as defined below comprises species placed by Kirkaldy in Division I of his original genus, characterised as having the "margin of the head between the vertex and frons acute and foliaceous."

The ventral surface of the head is concave posteriorly and convex anteriorly. The lateral frontal sutures, from a point in line with the hind margin of the eyes, diverge towards and above the antennae. The apex of the head is spatulate, and the apical margin which consists of a thickened border overhangs the ventral surface of the head. The crown is produced anteriorly and is transversely convex, and the ocelli which are on the dorsal surface of the head lie well away from the apical margin. The eyes are not in alignment with the margin of the head and the crown and pronotum are declivous.

In the structure of the pronotum, hind tibiae and male genitalia and in the venation and shape of the tegmina, species in this genus resemble those in the previous genus.

Three species described by Kirkaldy belong to this genus; *vulturnus* Kirk. (Type), *voltumna* Kirk. and *virgidemia* Kirk.

Figs. 14 and 15 represent the tegmen and head of *Vulturnus vulturnus*, and figs. 18 and 19 the head of *Vulturnus voltumna*.

VULTURNUS HACKERI sp. nov.

(Figs. 22, 23.)

Length, 3.8 mm.

Head, ventrally black but for the overhanging thickened ledge which is pale yellowish-brown. Dorsal surface very pale yellowish-brown mottled with brown; ocelli large. *Pronotum*, dark brown with yellowish-grey maculations. *Scutellum*, yellow with dark brown markings. *Tegmen*, silvery-white, reticulate between the veins, the reticulations dark brown and black. Appendix and supplementary appendix, pale hyaline brown. *Thorax* and *abdomen*, ventral surface black. *Legs*, fore femora brown, fore tibiae pale brown, the rest of the legs black, but for the spines on the hind tibiae, which are pale yellowish-brown.

Type ♀, from Sunnybank, Queensland (coll. H. Hacker), in the collection of the Queensland Museum. Reg. No. 5204.

VULTURNUS SORDIDUS sp. nov.

(Figs. 24, 25.)

Length, 3.8 mm.

Head, ventrally black; apical thickened margin pale brown, crown of head, *pronotum* and *scutellum* shining-brown with scattered small reddish-brown spots. *Tegmen*, proximal two-thirds coneolourous with the head, distal border, appendix and supplementary appendix, dark, hyaline brown. Adjacent to the apical brown border of the tegmen is a transverse hyaline-white fascia across which the veins are outlined in brown. *Thorax* and *abdomen*, ventral surface black. *Legs*, black, the spines on the hind tibiae brown and black.

Type ♂, from Samsonvale, Queensland (coll. H. Hacker), in the collection of the Queensland Museum. Reg. No. 5205.

VULTURNUS PUNCTULATUS sp. nov.

(Figs. 20, 21.)

Length, 3.8 mm.

Head, ventral surface black, apical thickened margin, pale yellowish-brown. Crown of head, *pronotum* and *scutellum*, black with numerous small yellowish-brown or reddish-brown spots. *Tegmen*, greyish-white or yellowish-white, with dark brown or black reticulations between the veins; appendix, supplementary appendix and

apex of tegmen hyaline smoky-grey. From one to three ante-apical cells may be hyaline-white. *Thorax* and *abdomen*, ventral surface, black. *Legs*, black, spines on hind tibiae, brown.

Type ♂, from Nanango District, Queensland (coll. H. Haeker), in the collection of the Queensland Museum, Brisbane. Reg. No. 5206.

VULTURNUS MONTANUS sp. nov.

(Figs. 16, 17.)

Length, 4 mm.

Head, ventrally black, overhanging thickened apical margin very pale yellow. Dorsal surface, pale yellow or ochreous with two round black spots between the ocelli and the apex of the head, and a few faint markings between the ocelli. *Pronotum*, anterior third, yellowish-brown; posterior two-thirds greyish-white, the whole with scattered dark brown markings. *Scutellum* marked with a pattern of yellow and dark brown. *Tegmen*, silvery-white with dark brown reticulations between the veins; appendix and supplementary appendix hyaline-brown. *Thorax* and *abdomen*, ventral surface black with pale brown markings.

Type ♀, from Leura, New South Wales (coll. J. W. E.), in the collection of the Queensland Museum, Brisbane. Reg. No. 5207.

THAUMATOSCOPIUS Kirk.

H.S.P.A. Exp. Sta. Bull. 1 (9); 462, 1906.

This genus of which the type is *Thaumatoscopus galeatus* Kirk. is very closely related to *Vulturnus*, differing principally in that the overhanging apical margin of the head is foliaceous and not thickened. One new species is described below.

THAUMATOSCOPIUS DUNKENSIS sp. nov.

(Figs. 26-29.)

Length, 4.2 mm.

Head, ventral surface black, almost flat; overhanging apical margin, brown. Crown, pale yellowish-brown. *Pronotum* and *scutellum* eoneolorous with the head. *Tegmen*, pale yellowish-brown, veins dark brown; reticulations between the veins consisting of irregularly-shaped dark brown spots; costal border distally and the apical and ante-apical cells in part, silvery-white; appendix and supplementary appendix, greyish-brown. *Thorax* and *abdomen*, ventral surface, black. Fore and middle *legs*, pale yellowish-brown; hind legs black; spines on the hind tibiae, pale yellowish-brown.

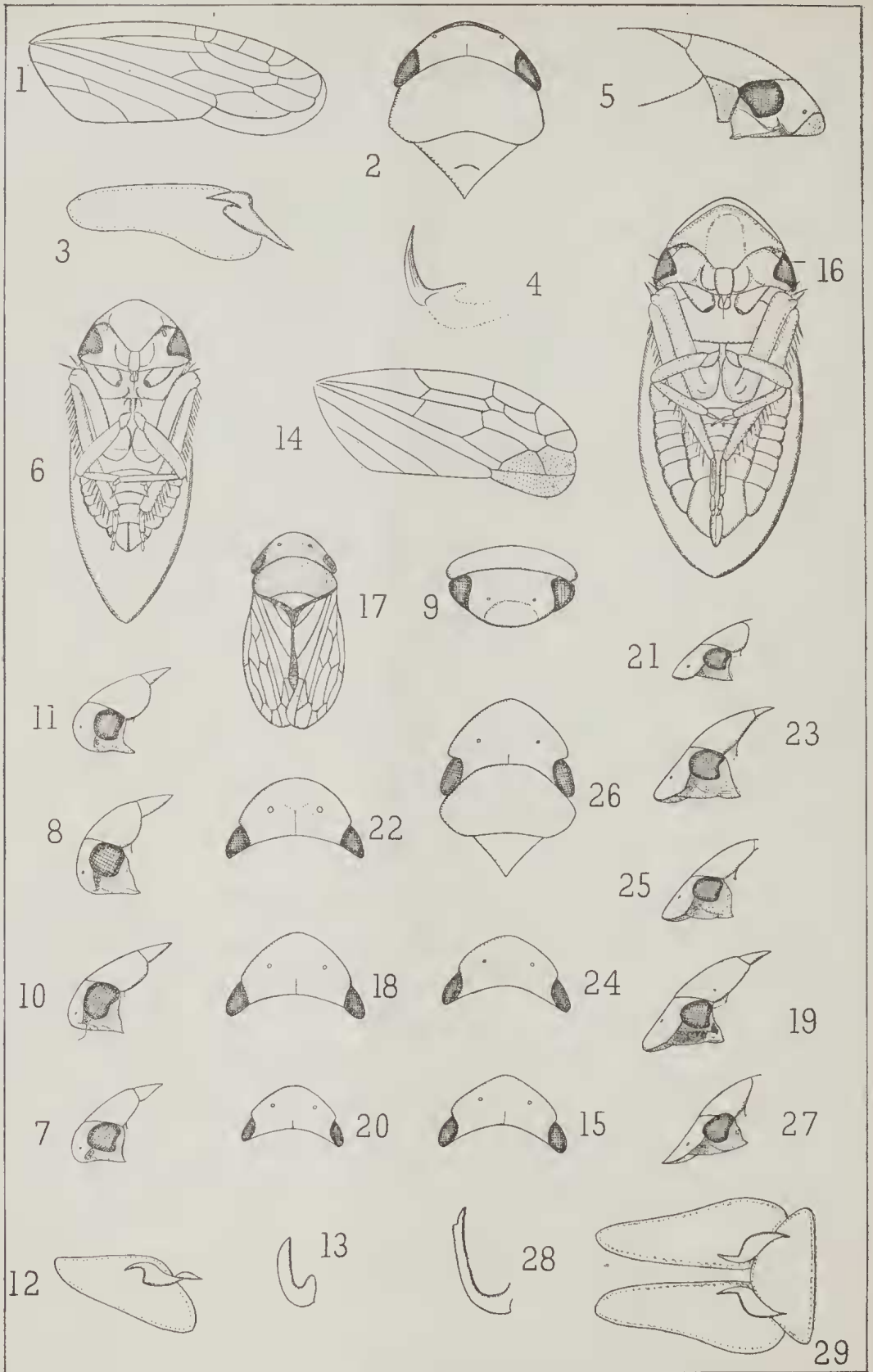
Type ♂, from Dunk Island, Queensland (coll. H. Haeker), in the collection of the Queensland Museum. Reg. No. 5208.

REFERENCE.

Baker, C. F. 1923, Philippine Journ. Sci. 23 (4); 351.

TEXT-FIGURE 1.

- Fig. 1. *Penthimia vanduzeei*, Tegmen.
 Fig. 2. *Penthimia vanduzeei*, Head and thorax, dorsal aspect.
 Fig. 3. *Penthimia vanduzeei*, Sub-genital plate and paramere.
 Fig. 4. *Penthimia vanduzeei*, Aedeagus.
 Fig. 5. *Penthimia australis*, Head and thorax in profile.
 Fig. 6. *Neovulturnus maculosus*, Ventral aspect.
 Fig. 7. *Neovulturnus maculosus*, Head and thorax in profile.
 Fig. 8. *Neovulturnus brunneus*, Head and thorax in profile.
 Fig. 9. *Neovulturnus brunneus*, Head, anterior aspect.
 Fig. 10. *Neovulturnus pallidus*, Head and thorax in profile.
 Fig. 11. *Neovulturnus lapsus*, Head and thorax in profile.
 Fig. 12. *Neovulturnus lapsus*, Sub-genital plate and paramere.
 Fig. 13. *Neovulturnus lapsus*, Aedeagus.
 Fig. 14. *Vulturnus vulturnus*, Tegmen.
 Fig. 15. *Vulturnus vulturnus*, Head, dorsal aspect.
 Fig. 16. *Vulturnus montanus*, Ventral aspect.
 Fig. 17. *Vulturnus montanus*, Dorsal aspect.
 Fig. 18. *Vulturnus voltumna*, Head, dorsal aspect.
 Fig. 19. *Vulturnus voltumna*, Head and thorax in profile.
 Fig. 20. *Vulturnus punctulatus*, Head, dorsal aspect.
 Fig. 21. *Vulturnus punctulatus*, Head and thorax in profile.
 Fig. 22. *Vulturnus hackeri*, Head, dorsal aspect.
 Fig. 23. *Vulturnus hackeri*, Head and thorax in profile.
 Fig. 24. *Vulturnus sordidus*, Head, dorsal aspect.
 Fig. 25. *Vulturnus sordidus*, Head and thorax in profile.
 Fig. 26. *Thaumatoscopus dunkensis*, Head and pronotum, dorsal aspect.
 Fig. 27. *Thaumatoscopus dunkensis*, Head and thorax in profile.
 Fig. 28. *Thaumatoscopus dunkensis*, Aedeagus.
 Fig. 29. *Thaumatoscopus dunkensis*, Sub-genital plate and paramere.



Penthimiidae. Text-figure 1.